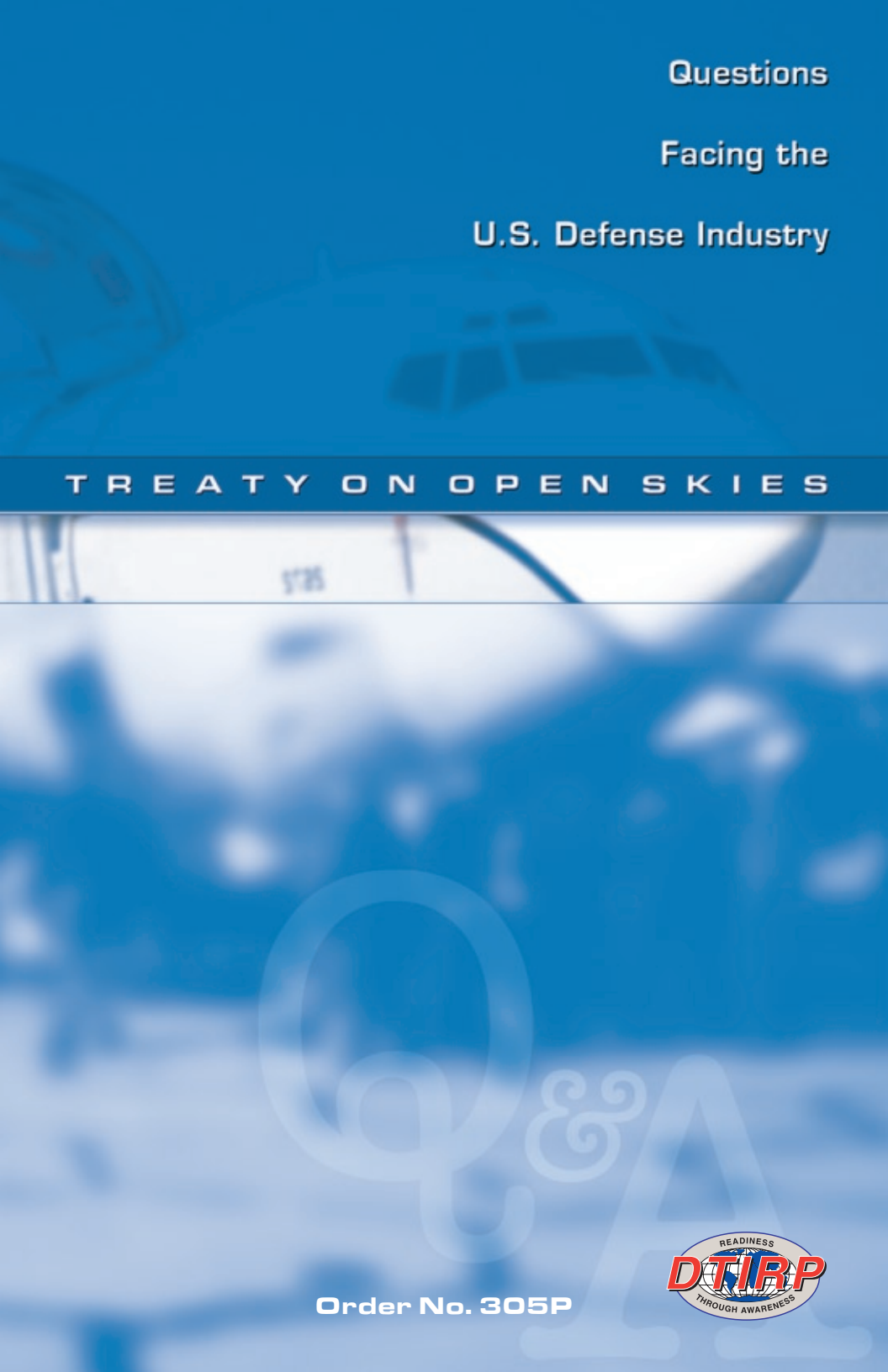
Questions Facing the U.S. Defense Industry

TREATY ON OPEN SKIES



Order No. 305P

DTIRP
READINESS THROUGH AWARENESS

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DTIRP Outreach Program
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INTRODUCTION

The Treaty on Open Skies, which entered into force on January 1, 2002, is intended to enhance military openness and transparency among the participating states of the Organization for Security and Cooperation in Europe (OSCE). Specifically, the Treaty permits States Parties to fly observation missions anywhere over the territory of other States Parties using unarmed aircraft equipped with a treaty-approved suite of sensors. These sensors include optical panoramic and framing cameras, video cameras, synthetic aperture radar (SAR), and infrared line-scanning devices.

This pamphlet provides answers to many of the fundamental questions frequently asked by defense contractors and industry representatives. These questions include:

- How might the Treaty on Open Skies affect my facility?
- How powerful are the sensors on the Open Skies aircraft?
- What types of assistance are available from the U.S. Government?

The answers to these important questions, combined with the assistance provided by the Department of Defense (DoD), the Defense Threat Reduction Agency (DTRA), and the Defense Treaty Inspection Readiness Program (DTIRP), can help you reduce any adverse effects associated with the implementation of the Treaty on Open Skies and the conduct of observation mission flights.

Remember: information can be a powerful countermeasure.

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Who are the States Parties to the Treaty on Open Skies?

There are 34 States Parties to the Treaty on Open Skies. In addition, Kyrgyzstan is a signatory state but has not yet ratified the Treaty. Cyprus is awaiting accession. All States Parties are OSCE participating states and are listed in the table below.

34 States Parties and 2 Prospective States Parties

Belarus	Estonia	[Kyrgyzstan][2]	Russia
Belgium	Finland	Latvia	Slovak Republic
Bosnia-Herzegovina	France	Lithuania	Slovenia
Bulgaria	Georgia	Luxembourg	Spain
Canada	Germany	Netherlands	Sweden
Croatia	Greece	Norway	Turkey
[Cyprus][1]	Hungary	Poland	Ukraine
Czech Republic	Iceland	Portugal	United Kingdom
Denmark	Italy	Romania	United States

[1]Applied for accession as of June 2005

[2]Signed, but not ratified

As of June 2006

How may other states accede to the Treaty?

To accede to the Treaty, states may apply to the Open Skies Consultative Commission (OSCC), which is the decision-making body established by the Treaty. The OSCC is empowered to consider the accession of any state, which in its judgment is able and willing to contribute to the objectives of the Treaty.

In addition, former Soviet republics may sign, ratify, and deposit an instrument of accession at any time.

Are any areas of the United States exempt from observation mission flights?

No. All States Parties are permitted to fly anywhere within the territory and territorial waters of any other State Party. United States territory subject to observation mission flights includes all of the continental United States, Alaska, Hawaii, Puerto Rico, Guam, Johnston Island, the Marshall Islands, and the Virgin Islands. Even normally restricted or prohibited airspace, such as Cape Canaveral, is not exempt. Only legitimate flight safety concerns can preempt a flight over a particular area.

What kinds of aircraft may be used?

No particular aircraft is specified as the official aircraft for an Open Skies observation mission flight. Instead, each Party may designate the type of aircraft it wishes to use. The United States currently maintains two OC-135B aircraft to conduct Open Skies observation mission flights. Other parties use the An-30, Tu-154, Andover, and C-130 aircraft, among others.

The performance characteristics of the different aircraft do not greatly affect the observation missions they perform. For example, although the OC-135B can stay aloft longer than other Open Skies aircraft, treaty limits on flight time and distance prevent it from outperforming other shorter-range aircraft.

The Treaty also permits a "taxi option" wherein the observed Party may use its own aircraft when a mission is conducted over its territory. For example, the United States could require a Russian observation team to use a U.S. aircraft instead of a Russian aircraft, when conducting a mission over U.S. territory.

If the observed Party does not invoke the "taxi option" (the United States plans not to do so), the Treaty also allows the observing Party to use a third party's aircraft. Consequently, a mission over the territory of the United States could be flown using any State Party's designated aircraft.

What types of sensors may be used?

All Open Skies observation aircraft may carry and use four types of imaging sensors:

- optical panoramic and framing cameras;
- video cameras with real-time display;
- synthetic aperture radar (SAR); and
- infrared (IR) line-scanning devices.

Additional or upgraded sensors could be included in the future if all States Parties agree.

The Treaty restricts how these sensors may be used. One optical framing camera is permitted to take pictures directly below the observation aircraft, while two others may take oblique pictures from both sides of the aircraft. A fourth panoramic camera may be used to take a series of pictures that will render a wide-angle view of the photographed area. Video cameras can record color video images and provide them in real-time display to the foreign observers on board the aircraft. Sideways-looking synthetic aperture radar (SAR) can produce an image in inclement weather or in darkness. The Treaty permits use of the SAR only on one side of the aircraft at a time.

Finally, Open Skies aircraft may carry infrared line-scanning devices (IR). The IR sensors can detect relative temperature differences of as little as 2 degrees Celsius between objects on the ground during day or night. However, during the first 3 years following EIF, infrared devices could only be used by mutual agreement between the observed and observing Parties on a case-by-case basis. After this initial period, IR sensors may be used routinely without any special agreement.

What capabilities do the sensors have?

The Treaty on Open Skies permits optical and video cameras to have a maximum ground resolution of 30 centimeters, or about one foot. This means that two objects must be at least 30 centimeters apart, or be at least 30 centimeters in size, to be recognized as separate objects. This resolution normally permits a photo interpreter to detect groups of people engaged in outdoor activities and to identify industrial equipment and vehicles.

As a further constraint, optical cameras are prohibited from obtaining 30 centimeters resolution beyond 50 kilometers, or about 31 statute miles or 27 nautical miles. Should the cameras incidentally image objects more distant than 50 kilometers, image resolution will be degraded.

The permitted ground resolution for the SAR is 3 meters, or about 10 feet. This comparatively poor resolution allows recognition of the presence of very large equipment or buildings. The SAR is capable of imaging through certain thin materials, such as wood or canvas. Additionally, the full 3 meter resolution is easily obtained from as far away as 50 kilometers.

Finally, infrared line-scanning devices are limited to 50 centimeters resolution, or about 20 inches. They can detect large cool objects such as liquid in storage tanks, or small warm objects such as operating (or recently operated) vehicles or machinery. Infrared sensors can also detect things such as exhaust vents and power sources that are not thermally shielded.

As you would expect, Open Skies observation missions primarily affect outdoor activities such as research, testing, and evaluation programs involving large objects. In addition, Open Skies aircraft sensors are capable of collecting information not available from

How do we know that only permitted sensors are used?

commercial satellites. For example, the SAR permits Open Skies aircraft to perform observation missions in inclement weather and at night. The oblique observation angles provided by the aircraft's low altitude, and the near simultaneous views from other sensors, provide imaging capabilities that are not available from commercial or military satellites. Further, the resolution of commercial IR satellite sensors is not nearly as high as the infrared sensors permitted on Open Skies aircraft.

To ensure that each Open Skies observation aircraft and its on-board sensors meet treaty-permitted specifications, each aircraft and sensor must pass a ground and in-flight certification before they may be approved for use. Part of this certification process is to confirm that the resolution of each sensor is within treaty limits. The certification also establishes a minimum altitude at which each sensor may be operated to prevent the possibility of a sensor attaining a greater degree of resolution than is allowed under the Treaty.

Any State Party may attend the certification of another Party's aircraft. Once certified, neither the aircraft nor its on-board sensors may be changed without undergoing recertification.

In addition to certification, the Open Skies aircraft and its sensors undergo a pre-flight inspection by the observed Party prior to each observation mission fight. In the United States, personnel from DTRA's Technical Equipment Inspection (TEI) branch carry out this pre-flight inspection to confirm that no alterations have been made since the most recent certification.

When the observed Party exercises its right to invoke the "taxi option," which allows the observed Party to provide its own Open Skies aircraft for the observation mission flight, the observed Party is obligated to give the observing Party an opportunity to inspect the aircraft and its sensors prior to use.

In addition, as part of the pre-flight inspection, a State Party may request a demonstration flight of another Party's aircraft to ensure that its sensors and other associated equipment correspond to the previously certified specifications. A State Party may also request a demonstration flight when a pre-flight inspection indicates that there has been a change from the previously certified data.

When did observation mission flights begin?

Observation mission flights officially began 60 days after the Treaty on Open Skies entered into force on January 1, 2002, and after aircraft certifications had been completed. The majority of observation mission flights occur over Russia and other European countries. The United States conducted its first observation mission in December 2002. This flight was over Russia.

In addition, since 1993, the United States has participated in mutual, reciprocal joint trial flights (JTFs). These training flights help the Parties prepare for actual observation mission flights and work out procedural details.

Joint trial flights have been conducted over U.S. territory by Belgium, Bulgaria, Canada, the Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, Netherlands, Poland, Russia, Slovak Republic, Slovenia, Turkey, and Ukraine.

How many observation mission flights will there be over U.S. territory each year?

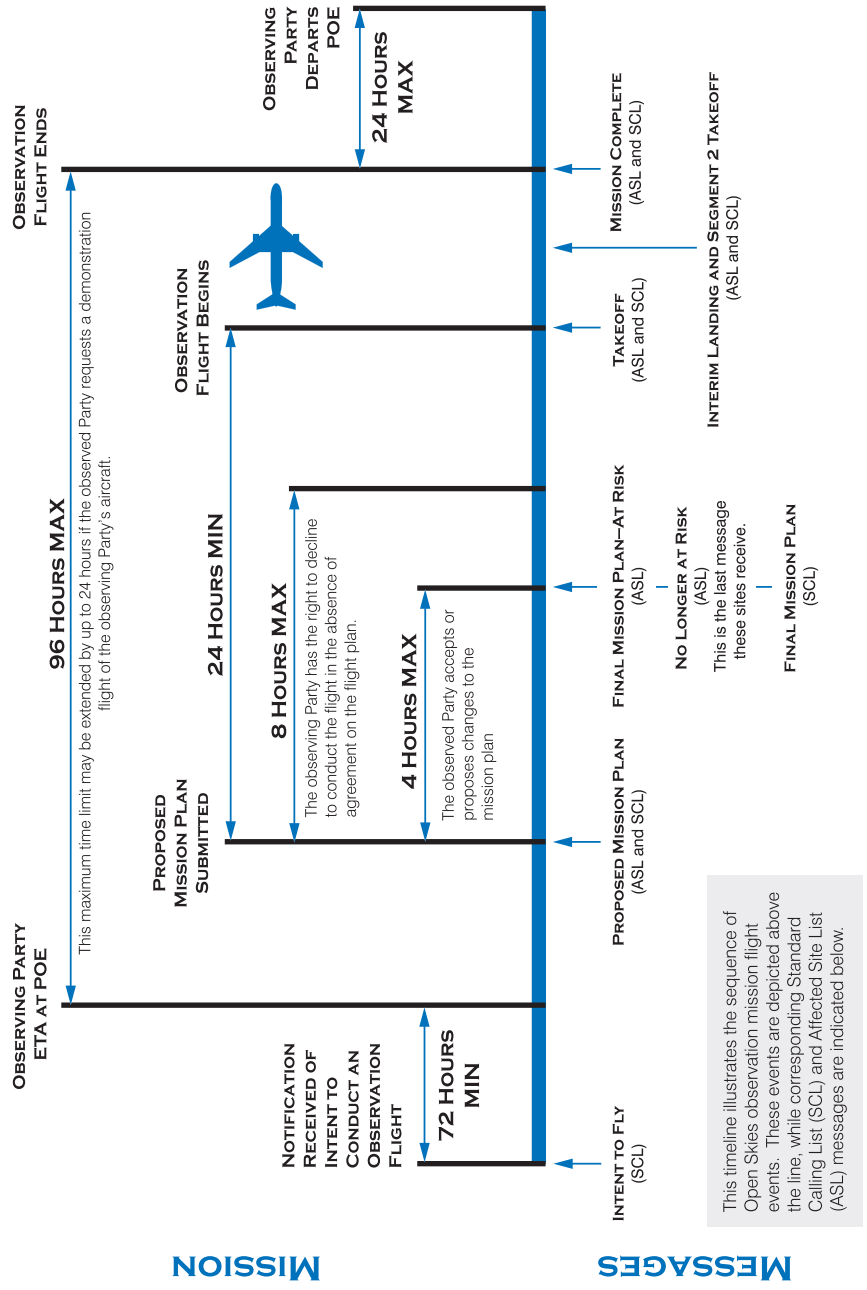
Annex A to the Treaty on Open Skies specifies the maximum number of observation mission flights each State Party is obliged to accept over its territory each year. During the first three years of treaty implementation, States Parties were obliged to accept only 75 percent of these annual quotas. Full implementation quotas began in 2006 and will continue indefinitely.

The United States and Russia have the highest quotas. Each is obligated to accept up to 42 observation mission flights per year. However, the actual number of mission flights a State Party may expect to receive in a given year is subject to the annual negotiation and quota distribution process conducted in the OSCC.

Each year, the States Parties are obligated to submit their requests to fly observation missions over other States Parties to all States Parties and to the OSCC by October 1st. If the total number of requests to fly over a particular State Party does not exceed the treaty maximum established for that state, the actual mission quota for the coming year will be the same as the number of requests submitted and approved by the OSCC. If the number of requests exceeds the quota maximum specified in the Treaty, the Parties requesting observation mission flights will be obliged to negotiate among themselves to reach an acceptable number. In the case of the United States, that number may not exceed 42.

To date, only Russia has expressed a desire to fly over the United States. Russia conducted two observation mission flights in 2004 and two in 2005. In 2006, Russia declared its intent to increase this number to four observation missions over the United States.

Timeline: Open Skies Observation Mission



This timeline illustrates the sequence of Open Skies observation mission flight events. These events are depicted above the line, while corresponding Standard Calling List (SCL) and Affected Site List (ASL) messages are indicated below.

How long can an observation mission flight last?

The Treaty on Open Skies limits both the time and distance of observation mission flights. The maximum amount of time allowed from the moment the observation team arrives in the United States until the mission flight is completed is 96 consecutive hours. This includes any refueling stops or rest periods required during the flight. However, the mission window may be extended by 24 hours when a demonstration flight is conducted.

The maximum flight distance is based primarily on the geographical size of each State Party and on the point where the mission flight originates. In the United States, there are two different maximum distances for observation mission flights, depending on the point of origin (see the table below). These two distances were established to ensure that the States Parties have an opportunity to fly over any part of the United States.

Maximum Flight Distance

Origination	Distance
Wright-Patterson AFB, OH	6,000 km (3,270 nm)
Travis AFB, CA	6,000 km (3,270 nm)
Elmendorf AFB, AK	3,750 km (1,989 nm)

Who accompanies the foreign observation team while inside the United States?

Escort teams from DTRA accompany foreign observation teams while inside the United States, including while on board the Open Skies aircraft regardless of aircraft ownership. DTRA escorts ensure that all mission activities strictly adhere to those permitted by the Treaty and that they are conducted for legitimate treaty-specified purposes.

When a U.S. observation aircraft is used, a U.S. Air Force crew will fly the aircraft and DTRA escorts will either operate the sensors while the observing Party watches, or monitor the observation team members while they operate the sensors. When the United States allows an observing Party to use its own aircraft, or the aircraft of a third Party, DTRA escorts are present at each sensor station and in the cockpit. The escorts ensure that the observation flight adheres to the agreed flight plan and that the sensors are operated solely in accordance with the technical provisions of the Treaty.

What happens to the imagery collected?

After the film or magnetic tape is removed from the sensor, it is placed in a sealed container in the presence of both Parties for transport to an agreed processing facility. Depending on whether the observed or the observing Party processes the film, the Treaty allows either 3 or 10 days, respectively, to develop and duplicate all film used during the mission. The U.S. Government will receive a duplicate or first generation copy of all imagery collected during a mission over U.S. territory.

The Treaty also requires the Parties to make the imagery and data collected during all observation mission flights available upon request to any State Party willing to pay the costs of reproduction. Consequently, any State Party can receive a copy of the imagery and data collected during any observation flight over any other State Party, whether or not they participated in the observation mission.

However, as stated earlier, the Treaty specifies that imagery collected during Open Skies observation mission flights must be used exclusively for legitimate treaty purposes. For this reason, the U.S. Government cannot release the data it collects during missions flown over another Party's territory to private citizens or organizations without the permission of the observed Party. Whether or not the data collected over the United States will be available to private U.S. citizens and organizations has not been determined.

What mechanism, if any, exists to assist a facility with preparing for an impending Open Skies observation mission flight?

Although the Treaty on Open Skies is designed to promote military transparency, there could be programs and activities that are not treaty-related and should not be overflown. The United States is committed both to being in full treaty compliance and to minimizing any impacts or risks associated with the conduct of observation mission flights. For this reason, DoD developed the Passive Overflight Module (POM) and the Telephone Notification System (TNS) to rapidly notify facilities in advance of impending observation mission flights and to keep facilities informed about whether they will be located along the flight path and potentially be within range of onboard sensors.

Shortly after a foreign observation team arrives in the United States, team members provide a proposed mission plan to U.S. officials. The proposed mission plan and flight path information are entered immediately into the POM, which is part of the Open Skies Management and Planning System (OSMAPS). This system allows DTRA personnel to identify potentially affected facilities and to generate the appropriate messages for subscribed facilities.

These messages are transmitted from a 24-hour DTRA Operations Support Center via the Automated Digital Network (AUTODIN) and the Telephone Notification System (TNS), an auto-dialing system. Using standard telephone lines, notification messages can be sent and received in the form of email, voice phone call, fax, pager, or automated voice messages. Typical messages include:

- initial 72-hour notice of an observing Party's intent to conduct an observation mission flight;
- proposed mission plan message;
- final mission plan message:
- takeoff and interim landing messages; as well as
- mission completion and other miscellaneous messages.

Once notified, facilities can take appropriate measures to prevent or minimize any adverse impacts an observation mission flight may have on their schedules and activities, or conversely, any adverse impacts their schedules and activities may have on an observation mission.

How can a facility receive advance notification and flight status messages about Open Skies mission flights?

To receive advance notification and flight status messages about impending and ongoing Open Skies observation mission flights, facilities are required to subscribe to this service by completing an Open Skies Database Management Facility (DMF) registration form. This form only requires facilities to provide general information, such as the facility's name, location (including latitude and longitude coordinates), point of contact, and telephone numbers.

To receive a DMF registration form, contact your Defense Security Service (DSS) Industrial Security representative or the Open Skies Division at DTRA by calling 703-767-0802 or DSN 427-0802, or by sending a fax to 703-767-0505 or DSN 427-0505.

How much does it cost to receive advance notification and flight status messages?

The advance notification and flight status messages sent by the Open Skies Division at DTRA are provided at no charge to subscribed facilities. The costs for this service are paid by DoD.

Who will cover the costs associated with a disruption to facility operations resulting from an observation mission flight?

Facility costs associated with a disruption to operations resulting from an Open Skies observation mission flight are the responsibility of the affected facility. This is also the case with the costs incurred as a result of compliance verification activities conducted under other arms control treaties and agreements. However, the U.S. Government makes every effort to minimize these expenses and provides site preparation assistance as well as advance notification and flight status messages at no charge to facilities.

CONCLUSION

The Treaty on Open Skies entered into force on January 1, 2002. For the U.S. defense industry, the potential impact of Open Skies observation mission flights presents several challenges. Significant points to remember are:

- The Treaty permits Open Skies observation aircraft to fly anywhere over the territory of the United States. However U. S. escorts are always present and on board the aircraft to monitor all aspects of the mission including the operation of the imaging sensors.
- No part of the United States may be excluded from being overflown during an Open Skies observation mission flight, and the United States may receive up to 42 observation mission flights each year.
- All observation aircraft are permitted to be equipped with optical, video, radar, and infrared sensors.
- The Passive Overflight Module (POM) conducts pre-flight analyses of Open Skies observation missions, and produces advance notification and flight status messages to keep facilities informed about when they may be overflown during the mission.

To obtain additional information about the Treaty on Open Skies, other arms control treaties, and the application of appropriate security countermeasures, contact the DTIRP Outreach Program Coordinator at 1-800-419-2899 or by email at dtirpoutreach@dtra.mil. You may also contact your local Defense Security Service (DSS) Industrial Security representative or your government sponsor. Additional arms control security-related information and services are also available on the DTIRP website at http://dtirp.dtra.mil.

LIST OF ACRONYMS

AUTODIN	Automated digital network
DMF	Database management facility
DoD	Department of Defense
DSS	Defense Security Service
DTRA	Defense Threat Reduction Agency
EIF	Entry into force
JTF	Joint trial flight
OSCC	Open Skies Consultative Commission
OSCE	Organization for Security and Cooperation in Europe
OSMAPS	Open Skies Management and Planning System
TNS	Telephone notification system
POE	Point of entry
POM	Passive overflight module
SAR	Synthetic aperture radar

RELATED MATERIALS

316A *The U.S. Experience with Joint Trial Flights—A History*
Article

315P *Open Skies Notification System*
Pamphlet

314P *Guide for Treaty on Open Skies Observation Mission Overflights*
Pocket Guide

308W *The Treaty on Open Skies* Sensor Capabilities (Navy)
Video

304W *The Treaty on Open Skies and Its Impact on U.S. Facilities*
Video

302P *Treaty on Open Skies—The Impact*
Pamphlet

301B *Facility Observation Flights under the Treaty on Open Skies*
Bulletin

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